

Seetru Limited

Seetru are Bristol-based manufacturers of safety relief and other special purpose ancillary valves for a wide range of compressed air, industrial gas, refrigerants, powder, steam, liquid and liquefied gas applications. Seetru change-over valves offer increased plant and process efficiency.

Seetru liquid level gauges are primarily of two types, sight gauges and magnetic float bypass gauges. Many of the gauges are direct reading though most have optional electronic remote reading systems and computer interfaces.

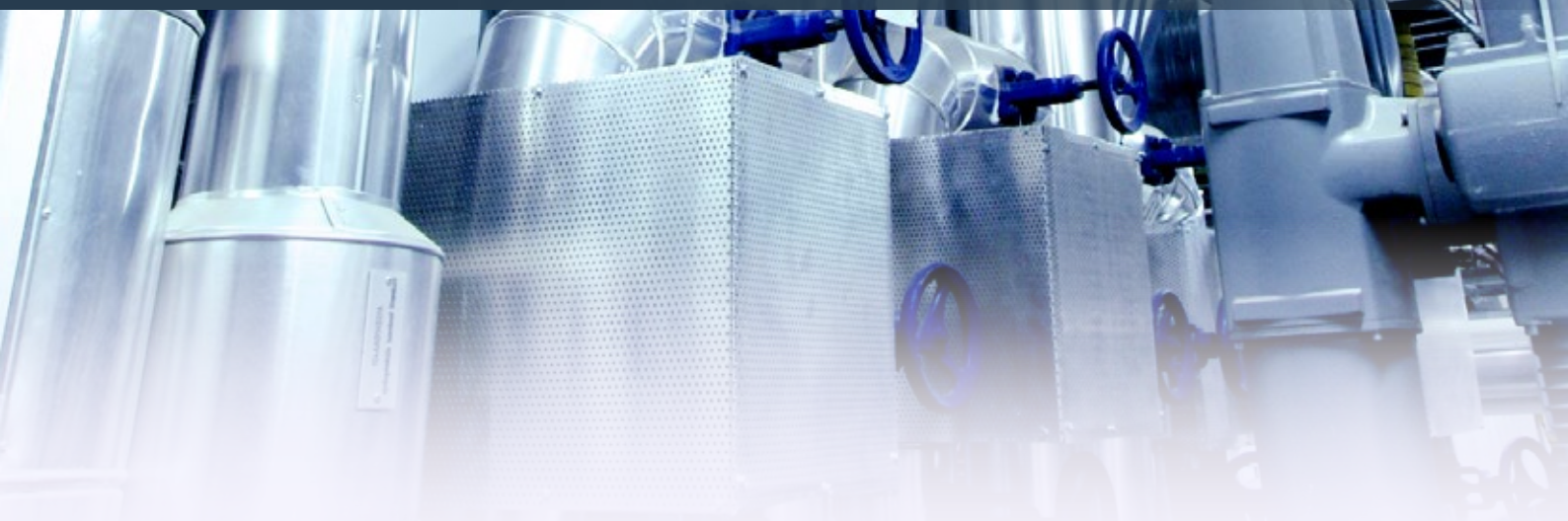


Seetru Products

for the refrigeration industry



REFRIGERATION



Seetru Limited
That's Safety!

Edition 4 (18.1.2024)

Repeatable bubble-tight sealing performance



Safety Relief Valves and Change Over Valves

Suitable for the following industries/applications:

- Compressor manufacture
- Industrial refrigeration
- Commercial refrigeration
- Refrigeration chillers
- Ice making machinery
- Air conditioning
- Ammonia refrigeration (stainless steel valves)

The Seetru range of safety valves for refrigeration applications are designed to meet the needs of the refrigeration industry, offering safety valve technology for compressor manufacturers, industrial refrigeration, commercial refrigeration, ice making systems and air conditioning. The valves are compact and designed with bonded sealing technology and the highest possible sealing performance to comply with most stringent environmental standards.

The models that use bonded elastomer sealing are leak tested to better than 10⁻⁵ mbar litres/sec on Helium. This is equivalent to a leakage rate of less than 1oz in ten years.

These valves meet important international standards which include: ISO-4126-1 & -7 and ASME BPVC VIII.1 & XIII design codes as well as type test approvals from TÜV and the National Board. These products comply with the requirements of the European Pressure Equipment Directive (PED) and are available with both the CE mark as well as the UV stamp, and have wide international approvals such as the EAC (TR CU) customs union certification and declaration and the Canadian CRN. Seetru products are fully compliant with the requirements of the UK Pressure Equipment (Safety) Regulations and come with the UKCA mark.

Liquid Level Gauges for the Refrigerant Industry

We are able to supply our Refrigeration gauges with brass, mild steel or stainless steel end units with either P.T.F.E. or elastomer seals to suit the refrigerant.

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646 / 641	Enclosed Discharge Safety Valve Threaded connections	Stainless steel construction with bonded elastomer sealing	7.0 to 55.2 bar g (depending on bore size)	10mm, 13mm or 18mm Nominal Bore For use with refrigerant gases including CO2 and Ammonia.	10-12
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for refrigeration

Type 319

Inline Safety Valves made from Brass <
Atmospheric discharge valve with threaded connections <

Example Applications

- Refrigeration compressor manufacture
- Industrial refrigeration
- Commercial refrigeration
- Ice making machinery
- Air conditioning

Specifications

- Inlet connections: 3/8" to 1/2" or 7/8" x 14UNF (depending on bore size)
- Temperature: -30°C to +200°C
- Pressure range: 13.5 to 55.2 bar (depending on bore size)

Materials of Construction

Component	Material	Grade
Inlet	Brass	CW614N
Body	Brass	CW614N
Internal Parts	Brass	CW614N
Spring	Stainless Steel	1.4310 (302) & 1.4568 (301)



Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- ASME BPVC VIII.1 & XIII (UV)
- CRN
- EAC



Seal Materials

Seal Material	Temperature Range
Perfluoroelastomer (FFKM)	-30°C to +200°C

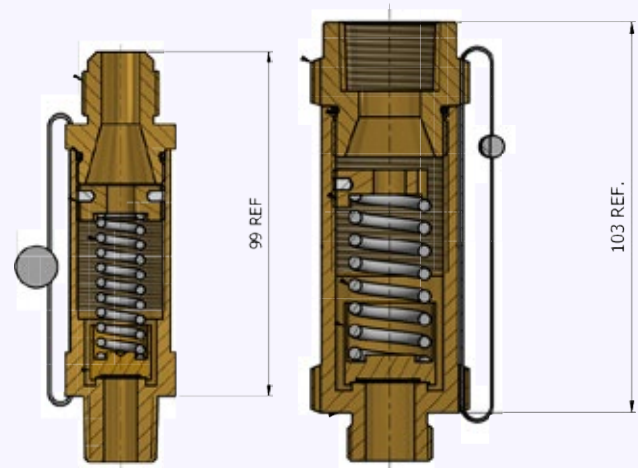
Standard seal materials shown, others are available.

Technical information by bore size

Bore size	9.5		13.08mm	
Inlet Size	3/8"	1/2"	1/2"	7/8" (UNF)
Outlet Size	1/2" or 5/8" Flare		3/4" NPT Female	
Flow Area	71mm ²		134.4mm ²	
H - Height	99mm		103mm	
TÜV allotted outflow coefficient	0.485		0.71	
NB Certified rated slope (ASME)	1.04 scfm/psia		3.47 scfm/psia	
Weight (approximate) Kg	0.8		1.3	
Set Pressure range - PED (CE) bar	13.5 to 50.0		16.2 to 26.8	
Set Pressure range - ASME (UV) psi	195.75 to 725.0		235.0 to 388.6	
Relieving pressure/fully open pressure	Set pressure +10%			
Reseating pressure	Set pressure -10%			

Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced.
Stable operation on flows down to 50% of valve rated capacity.

Valve drawing



Standard INLET Thread Connection Types

- NPT male thread
- UNF male thread

Standard OUTLET Thread Connection Types

- Flare outlet
- NPT female thread

Valve Selection Guide

Approval Required	Select Bore	Inlet Size	Inlet Thread Type	Outlet Threa Type	Seal Material
PED (CE)	Select bore size from above table	Select inlet size from above table	Select Inlet thread type	Select Outlet thread type	Perfluoroelastomer (FFKM)
PED (CE), ASME (UV) & CRN					

EAC marking available upon request

***Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.**

Example of Valve Selection Process

Example Selection	CE/PED, ASME/UV & CRN	9.5	1/2"	NPT	5/8" Flare	FFKM	16.2 bar/ 235 psi
	Approval	Bore = 9.5mm	Inlet Size	Inlet Thread Type	Outlet	Seal	Set Pressure

Capacity Table - In accordance with ISO 4126, Air at 0°C at 1.013 bar - Kg/min

Type 319-Inline valve: Flow rates at 10% above the set pressure



Set Pressure		Bore Size (D0)			
		9.5mm	13.08mm		
bar	psi	Kg/min	Kg/Min		
13.5	195.75	7.9			
14	203	8.2			
16	232	9.3			
16.2	234.9	9.5	18.7		
18	261	10.4			
20	290	11.5			
24	348	13.7			
25.9	375.55	14.8	29.3		
26	377	14.9			
26.8	388.6	15.4	30.2		
28	406	15.9			
30	435	17.1			
35	507.5	19.9			
40	580	22.7			
45	652.5	25.5			
50	725	28.2			

For any intermediate pressures/flows please contact Seetru

Capacity Table - In accordance with ASME BPVC.XIII, AIR at 60°F and 14.7 psia/scfm. SCFM

Type 319-Inline Valve: Flow rates at 10% above the set pressure



Set Pressure		Bore Size (D0)			
		9.5mm	13.08mm		
psi	bar	SCFM	SCFM		
195.75	13.50	239.2			
200	13.79	244.0			
235	16.20	284.0	609.0		
250	17.24	301.2			
300	20.69	358.5			
325	22.41	387.0			
350	24.14	415.5			
375.6	25.90	444.9	954.0		
388.6	26.80	459.9	987.0		
400	27.59	472.9			
450	31.03	530.0			
500	34.48	587.0			
550	37.93	644.5			
600	41.38	702.0			
650	44.83	759.0			
700	48.28	816.0			
725	50.00	845.0			

For any intermediate pressures/flows please contact Seetru

for refrigeration

Type 636 / 631

Safety valves with bronze body <
Enclosed discharge valve with threaded connections <

Example Applications

- Compressor manufacture
- Industrial refrigeration
- Commercial refrigeration
- Ice making machinery
- Air conditioning

Specifications

- Inlet connections: 3/8" to 1 1/2" (depending on bore size)
- Temperature: -30°C to +200°C
- Pressure range: 6.6 to 55.2 bar (depending on bore size)

Materials of Construction

Component	Material	Grade
Inlet	Brass	CW614N
Body	Bronze	CC491K SB-62 C83600
Internal Parts	Brass	CW614N
Spring	Stainless Steel	1.4310 (302)



Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- ASME BPVC VIII.1 & XIII (UV)
- CRN
- EAC



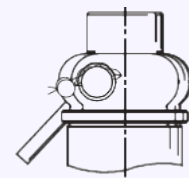
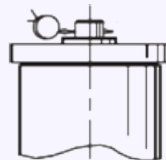
Seal Materials

Seal Material	Temperature Range
Perfluoroelastomer (FFKM)	-30°C to +200°C

Standard seal materials shown, others are available.

Valve cap / Top Fitting

- **Standard option** – Sealed Cap (gas tight cap)
- **Other option** – Sealed lever (gas tight)



Technical information by bore size

Bore size	9.5			13.7mm			17mm		
Inlet Size	3/8"	1/2"	3/4"	1/2"	3/4"	1"	1"	1 1/4"	1 1/2"
Outlet Size	3/4"			1"			1 1/2"		
Flow Area	70.9mm ²			147.7mm ²			227mm ²		
H - Height (Rota-lift cap version)	99mm (up to 33 bar) 113mm (33-55.2 bar)			135mm (up to 33 bar) 168mm (33-49 bar)			204mm		
TÜV allotted outflow coefficient	0.77			0.77			0.77		
NB Certified rated slope (ASME)	1.74 scfm/psia			3.47 scfm/psia			5.60 scfm/psia		
Weight (approximate) Kg	0.8			1.1			3.6		
Set Pressure range - PED (CE) bar	7.0 to 55.2			7.0 to 49.0			6.6 to 35.0		
Set Pressure range - ASME (UV) psi	101.5 to 800.4			101.5 to 710.5			95.7 to 507.5		
Relieving pressure/fully open pressure	Set pressure +10%								
Reseating pressure	Set pressure -10%								

Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced.
Stable operation on flows down to 50% of valve rated capacity.

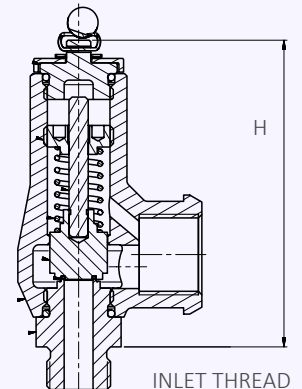
Standard INLET Thread Connection Types

- BSP Parallel male thread
- BSP Taper male thread
- NPT male thread

Standard OUTLET Thread Connection Types

- BSP Parallel female thread
- NPT female thread

Valves with Rota-lift Easing Gear



Valve Selection Guide

Approval Required	Valve type	Select Bore	Inlet Size	Inlet Thread Type	Outlet Threa Type	Easing Gear	Seal Material
PED (CE)	636	Select bore size from above table	Select inlet size from above table	Select Inlet thread type	Select Outlet thread type	Sealed Cap is the standard option.	Perfluoroelastomer (FFKM)
PED (CE), ASME (UV) & CRN	631						

EAC marking available upon request

***Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.**

Example of Valve Selection Process

Example Selection	CE/PED, ASME/UV & CRN	631	9.5	3/4"	NPT	NPT	Sealed Cap	FFKM	16.2 bar
	Approval	Valve Type	Bore = 9.5mm	Inlet Size	Inlet Thread Type	Outlet Thread Type	Easing Gear	Seal	Set Pressure

Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour Type 636: Flow rates at 10% above the set pressure



Set Pressure		Bore Size (D0)				
		9.5mm	13.7mm	17mm		
bar	psi	Nm ³ /Hour	Nm ³ /Hour	Nm ³ /Hour		
7	101.5	323.9	673.6	1037.3		
8	116	364.8	758.7	1168.2		
9	130.5	405.7	843.7	1299.2		
10	145	446.6	928.8	1430.2		
15	217.5	651.1	1354.0	2084.9		
20	290	855.6	1779.3	2739.7		
25	362.5	1060.0	2204.5	3394.4		
30	435	1264.5	2629.7	4049.2		
35	507.5	1468.9	3054.9	4703.9		
40	580	1673.4	3480.2			
45	652.5	1877.9	3905.4			
49	710.5	2041.5	4245.6			
50	725	2082.4				
55.2	800.4	2295.0				

For any intermediate pressures/flows please contact Seetru

Capacity Table - In accordance with ASME BPVC.XIII, AIR at 60°F and 14.7 psia/scfm. SCFM Type 631: Flow rates at 10% above the set pressure



Set Pressure		Bore Size (D0)				
		9.5mm	13.7mm	17mm		
psi	bar	SCFM	SCFM	SCFM		
100	6.90	213.2	432.6	698.1		
150	10.34	307.2	623.4	1006.1		
200	13.79	401.2	814.2	1314.0		
250	17.24	495.3	1005.0	1621.9		
300	20.69	589.3	1195.8	1929.8		
350	24.14	683.3	1386.6	2237.8		
400	27.59	777.4	1577.4	2545.7		
435	30.00	843.2	1711.0	2761.2		
450	31.03	871.4	1768.2	2853.6		
500	34.48	965.4	1959.0	3161.5		
507.5	35.00	979.5	1987.6	3207.7		
550	37.93	1059.4	2149.8			
600	41.38	1153.4	2340.6			
650	44.83	1247.5	2531.4			
700	48.28	1341.5	2722.2			
710.5	49.00	1361.3	2762.3			
750	51.72	1435.5				
800.4	55.20	1530.3				

For any intermediate pressures/flows please contact Seetru

for refrigeration

Type 646 / 641

Safety valves with stainless steel body <
Enclosed discharge valve with threaded connections <

Example Applications

- Compressor manufacture
- Industrial refrigeration
- Commercial refrigeration
- Ice making machinery
- Air conditioning

Specifications

- Inlet connections: 3/8" to 1 1/2" (depending on bore size)
- Temperature: -30°C to +200°C
- Pressure range: 6.6 to 55.2 bar (depending on bore size)

Materials of Construction

Component	Material	Grade
Inlet	Stainless Steel	1.4401 (316)
Body	Stainless Steel	1.4408 (316)
Internal Parts	Stainless Steel	1.4401 (316)
Spring	Stainless Steel	1.4310 (302)



Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- ASME BPVC VIII.1 & XIII (UV)
- CRN
- EAC



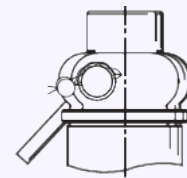
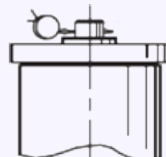
Seal Materials

Seal Material	Temperature Range
Perfluoroelastomer (FFKM)	-30°C to +200°C

Standard seal materials shown, others are available.

Valve cap / Top Fitting

- **Standard option** – Sealed Cap (gas tight cap)
- **Other option** – Sealed lever (gas tight)



Technical information by bore size

Bore size	9.5			13.7mm			17mm		
Inlet Size	3/8"	1/2"	3/4"	1/2"	3/4"	1"	1"	1 1/4"	1 1/2"
Outlet Size	3/4"			1"			1 1/2"		
Flow Area	70.9mm ²			147.7mm ²			227mm ²		
H - Height (Sealed cap version)	99mm (up to 33 bar) 113mm (33-55.2 bar)			135mm (up to 33 bar) 168mm (33-49 bar)			204mm		
TÜV allotted outflow coefficient	0.77			0.77			0.77		
NB Certified rated slope (ASME)	1.74 scfm/psia			3.47 scfm/psia			5.60 scfm/psia		
Weight (approximate) Kg	0.8			1.1			3.6		
Set Pressure range - PED (CE) bar	7.0 to 55.2			7.0 to 49.0			6.6 to 35.0		
Set Pressure range - ASME (UV) psi	101.5 to 800.4			101.5 to 710.5			95.7 to 507.5		
Relieving pressure/fully open pressure	Set pressure +10%								
Reseating pressure	Set pressure -10%								

Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced.
Stable operation on flows down to 50% of valve rated capacity.

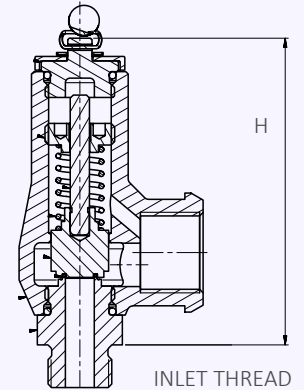
Standard INLET Thread Connection Types

- BSP Parallel male thread
- BSP Taper male thread
- NPT male thread

Standard OUTLET Thread Connection Types

- BSP Parallel female thread
- NPT female thread

Valves with Rota-lift Easing Gear



Valve Selection Guide

Approval Required	Valve type	Select Bore	Inlet Size	Inlet Thread Type	Outlet Threa Type	Easing Gear	Seal Material
PED (CE)	646	Select bore size from above table	Select inlet size from above table	Select Inlet thread type	Select Outlet thread type	Sealed Cap is the standard option.	Perfluoroelastomer (FFKM)
PED (CE), ASME (UV) & CRN	641						

EAC marking available upon request

***Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.**

Example of Valve Selection Process

Example Selection	CE/PED, ASME/UV & CRN	641	9.5	3/4"	NPT	NPT	Sealed Cap	FFKM	16.2 bar
	Approval	Valve Type	Bore = 9.5mm	Inlet Size	Inlet Thread Type	Outlet Thread Type	Easing Gear	Seal	Set Pressure

Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour Type 646: Flow rates at 10% above the set pressure



Set Pressure		Bore Size (D0)		
		9.5mm	13.7mm	17mm
bar	psi	Nm ³ /Hour	Nm ³ /Hour	Nm ³ /Hour
7	101.5	323.9	673.6	1037.3
8	116	364.8	758.7	1168.2
9	130.5	405.7	843.7	1299.2
10	145	446.6	928.8	1430.2
15	217.5	651.1	1354.0	2084.9
20	290	855.6	1779.3	2739.7
25	362.5	1060.0	2204.5	3394.4
30	435	1264.5	2629.7	4049.2
35	507.5	1468.9	3054.9	4703.9
40	580	1673.4	3480.2	
45	652.5	1877.9	3905.4	
49	710.5	2041.5	4245.6	
50	725	2082.4		
55.2	800.4	2295.0		

For any intermediate pressures/flows please contact Seetru

Capacity Table - In accordance with ASME BPVC.XIII, AIR at 60°F and 14.7 psia/scfm. SCFM Type 641: Flow rates at 10% above the set pressure



Set Pressure		Bore Size (D0)		
		9.5mm	13.7mm	17mm
psi	bar	SCFM	SCFM	SCFM
100	6.90	213.2	432.6	698.1
150	10.34	307.2	623.4	1006.1
200	13.79	401.2	814.2	1314.0
250	17.24	495.3	1005.0	1621.9
300	20.69	589.3	1195.8	1929.8
350	24.14	683.3	1386.6	2237.8
400	27.59	777.4	1577.4	2545.7
435	30.00	843.2	1711.0	2761.2
450	31.03	871.4	1768.2	2853.6
500	34.48	965.4	1959.0	3161.5
507.5	35.00	979.5	1987.6	3207.7
550	37.93	1059.4	2149.8	
600	41.38	1153.4	2340.6	
650	44.83	1247.5	2531.4	
700	48.28	1341.5	2722.2	
710.5	49.00	1361.3	2762.3	
750	51.72	1435.5		
800.4	55.20	1530.3		

For any intermediate pressures/flows please contact Seetru

Enclosed Discharge Safety Relief Valves

Seetru Limited

for compressed air or gases

cryogenic & liquefied gas

refrigeration

Type 346 / 356

Safety valves with either Bronze or Stainless Steel body <
Enclosed discharge valve with threaded connections <

Example Applications

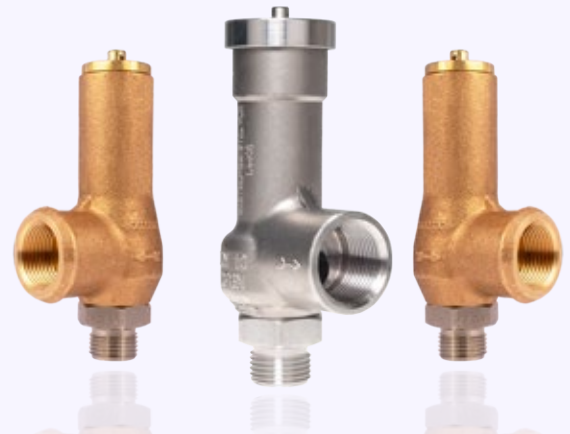
- Air/Gas systems
- Pressure vessels
- Medical gases
- Technical Gases
- CO2 refrigeration
- Ammonia refrigeration (34610)
- Cryogenic applications
- Liquefied gases

Specifications

- Inlet connections: 3/8" to 3/4"
- Temperature range: -196°C to +50°C
- Pressure range: 0.83 to 30.76 bar

Materials of Construction

Component	Material	Grade
Inlet	Stainless Steel	1.4401 (316)
Body	356 Valve = Bronze	C83600
	346 Valve = Stainless Steel	1.4408 (316)
Internal Parts	356 Valve = Brass	BS2874 CZ121
	346 Valve = Stainless Steel	1.4401 (316)
Spring	Stainless Steel	1.4310 (302)



Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- EAC
- Materials meet the requirements of BAM for oxygen service.

CE UK EAC

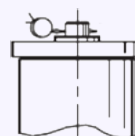
Seal Materials

Seal Material	Temperature Range
PTFE	-196°C to +50°C

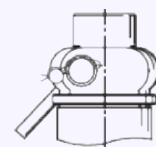
Standard seal materials shown, others are available.

Top Fitting Options

- **Standard Option**
Sealed Cap (gas tight cap)



- **Other options:**
Sealed lever (gas tight)

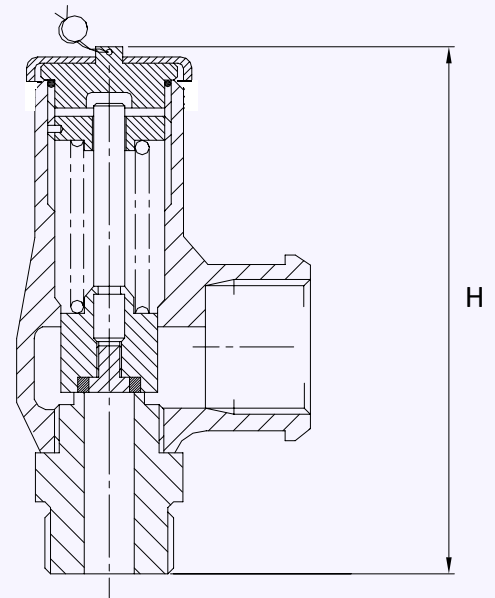


Technical information by bore size

Bore size	9.5mm (34610)			9.5mm (35610)		
	3/8"	1/2"	3/4"	3/8"	1/2"	3/4"
Inlet Size	3/8"	1/2"	3/4"	3/8"	1/2"	3/4"
Outlet Size	3/4"			3/4"		
Flow Area	70.9mm ²			70.9mm ²		
H - Height (Rota-lift cap version)	113mm			99mm		
TÜV alloted outflow coefficient	0.77 above 1.55 bar (contact Seetru for below 1.55 bar)			0.77 above 1.55 bar (contact Seetru for below 1.55 bar)		
Weight (approximate) Kg	0.7 (3.0 to 30.76 bar)			0.7 (3.0 to 30.76 bar)		
Set Pressure range - PED (CE) bar	0.8			0.8		
Relieving pressure/fully open pressure	Set pressure +10%					
Reseating pressure	Set pressure -10%					

Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced. Stable operation on flows down to 50% of valve rated capacity.

Valve drawing



Standard Thread Connection Types

- BSP Parallel male thread
- BSP Taper male thread
- NPT male thread

Standard Outlet Connection Types

- BSP Parallel female thread
- NPT female thread

Valve Selection Guide

Body Material	Valve Type	Select Bore	Inlet Size	Inlet Thread Type	Outlet Thread Type	Easing Gear	Seal Material
Stainless Steel	346	9.5mm	Select inlet size from above table	Select Inlet thread type	Select Outlet thread type	Sealed cap	PTFE
Bronze	356						

EAC marking available upon request

***Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.**

Example of Valve Selection Process

Example Selection	Bronze	356	9.5	1/2"	NPT	NPT	Sealed Cap	PTFE	23.5 bar
	Body Material	Valve Type	Bore = 9.5mm	Inlet Size	Inlet Thread Type	Outlet Thread Type	Top Fitting	Seal	Set Pressure

Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour
 Type 346/356: Flow rates at 10% above the set pressure



Set Pressure		Bore Size (D0)			
		9.5mm			
bar	psi	Nm ³ /Hour			
0.83	12.04	63.8			
1.0	14.50	71.4			
2.0	29.00	119.4			
3.0	43.50	160.3			
4.0	58.00	201.3			
5.0	72.50	242.1			
6.0	87.00	283.0			
7.0	101.50	323.9			
8.0	116.00	364.8			
9.0	130.50	405.7			
10.0	145.00	446.6			
15.0	217.50	651.1			
20.0	290.00	855.5			
25.0	362.50	1060.0			
30.0	435.00	1264.5			
30.76	446.02	1295.6			

For any intermediate pressures/flows please contact Seetru

for compressed air or gases

cryogenic & liquefied gas

refrigeration

hydrogen

Type 329

Safety valves with either Bronze or Stainless Steel body <
Enclosed discharge valve with threaded connections <

Example Applications

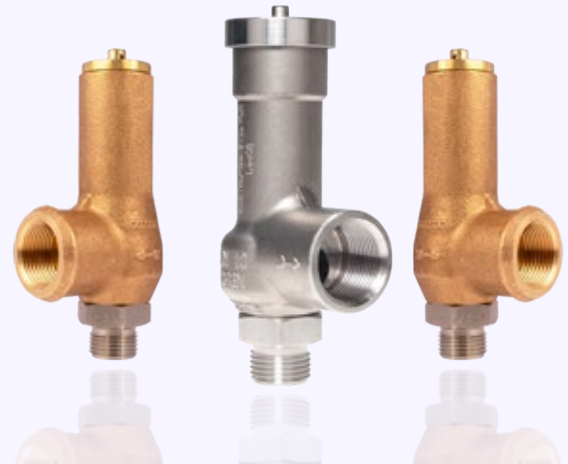
- Air/Gas systems
- Natural Gas
- CNG/LNG
- Pressure vessels
- Medical gases
- Technical Gases
- CO2 refrigeration
- Ammonia refrigeration (Stainless steel)
- Cryogenic applications
- Liquefied gases

Specifications

- Inlet connections: 3/8" to 3/4"
- Temperature range: -196°C to +70°C
- Pressure range: 53.0 to 370.0 bar

Materials of Construction

Component	Material	Grade
Inlet	Stainless Steel	1.4401 (316)
Body	Bronze	C83600
	Stainless Steel	1.4408 (316)
Internal Parts	Brass	BS EN 12164 CW614N
	Stainless Steel	1.4401 (316)
Spring	Stainless Steel	1.4310 (302)



Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- ASME BPVC VIII.1 & XIII (UV)
- EAC
- CRN



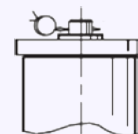
Seal Materials

Seal Material	Temperature Range
PTFE (up to 202 bar) PPS (202 to 370 bar)	-196°C to +70°C

Standard seal materials shown, others are available.

Top Fitting Options

- Standard Option
Sealed Cap (gas tight cap)

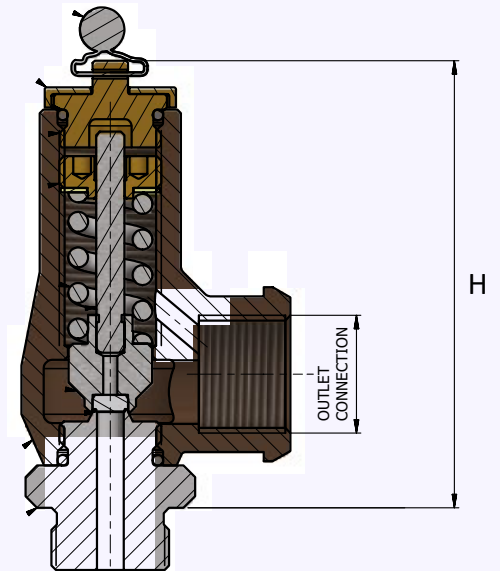


Technical information by bore size

Bore size	6mm		
Inlet Size	3/8"	1/2"	3/4"
Outlet Size	3/4"		
Flow Area	28.2mm ²		
H - Height	100mm (53.0 to 240.0 bar) 114mm (240.0 to 370.0 bar)		
TÜV allotted outflow coefficient	0.77		
NB Certified rated slope (ASME)	0.7scfm/psia		
Weight (approximate) Kg	0.8		
Set Pressure range - PED (CE) bar	53.0 to 370.0		
Set Pressure range - ASME (UV) psi	768.5 to 5365.0		
Relieving pressure/fully open pressure	Set pressure +10%		
Reseating pressure	Set pressure -15%		

Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced.

Valve drawing



Standard Thread Connection Types

- BSP Parallel male thread
- BSP Taper male thread
- NPT male thread

Standard Outlet Connection Types

- BSP Parallel female thread
- NPT female thread

Valve Selection Guide

Valve Type	Body Material	Approval Required	Select Bore	Inlet Size	Inlet Thread Type	Outlet Thread Type	Easing Gear	Seal Material
329	Stainless Steel Bronze	PED (CE) PED (CE), ASME (UV, NB), CRN	6mm	Select inlet size from above table	Select Inlet thread type	Select Outlet thread type	Sealed cap	PTFE

EAC marking available upon request


Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time

Example of Valve Selection Process

Example Selection	Bronze	329	PED (CE)	6	1/2"	NPT	NPT	Sealed Cap	PTFE	175 bar
	Body Material	Valve Type	Approval	Bore = 6mm	Inlet Size	Inlet Thread Type	Outlet Thread Type	Top Fitting	Seal	Set Pressure

Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour
 Type 329: Flow rates at 10% above the set pressure




Set Pressure			Bore Size (D0)			
			6mm			
bar	psi		Nm ³ /Hour			
53	768.5		879.6			
60	870.0		993.8			
70	1015.0		1156.9			
80	1160.0		1320.0			
90	1305.0		1483.1			
100	1450.0		1646.3			
150	2175.0		2461.9			
200	2900.0		3277.5			
250	3625.0		4093.1			
300	4350.0		4908.7			
350	5075.0		5724.4			
370	5365.0		6050.6			

For any intermediate pressures/flows please contact Seetru

Capacity Table - In accordance with ASME BPVC.XIII, AIR at 60°F and 14.7 psia/scfm. SCFM
 Type 329: Flow rates at 10% above the set pressure



Set Pressure			Bore Size (D0)			
			6mm			
psi	bar		SCFM			
768.5	53		602			
870	60		680			
913.5	63		714			
1203.5	83		937			
1305	90		1015			
1450	100		1127			
2175	150		1685			
2900	200		2243			
2929	202		2266			
3480	240		2690			
3625	250		2802			
4350	300		3360			
5075	350		3918			
5365	370		4141			

For any intermediate pressures/flows please contact Seetru

for compressed air or gases

steam

refrigeration

hydrogen

Type 946 Flanged

Safety valves made from Stainless Steel <
Enclosed discharge valve with flanged connections <
Metal to metal sealing <

Example Applications

- Air / gas compressors
- Pressure vessels
- Medical gases/Technical gases
- Refrigeration (including ammonia)
- Thermal relief
- Steam systems
- Hydrogen

Specifications

- Inlet connections: DN15 (1/2), DN20 (3/4") or DN25 (1") flange – DIN EN1092 and ANSI flanges are available
- Temperature range: -50°C to +250°C (depending on body o'ring material)
- Pressure range: 0.3 to 28.0 bar

Materials of Construction

Component	Material	Grade
Inlet & Outlet Flanges	Stainless Steel	1.4401 (316)
Body	Stainless Steel	1.4408 (316)
Internal Parts	Stainless Steel	1.4401 (316)
Spring	Stainless Steel	1.4310 (302)
Disc	Stainless Steel	AISI 440B

Approvals

- Designed in accordance with BS EN ISO-4126-1 &-7
- PED 2014/68/EU (CE)
- PE(S)R UK SI 2016 No. 1105 (UKCA)
- EAC
- Leak tightness at 90% set pressure to API 527 and in accordance with EN ISO 4126-1



Seal Materials

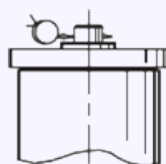
This valve using metal to metal sealing. There is a choice of o'ring used for the sealed cap/lever.

O'ring material – Top cap	Temperature Range
Viton® (FKM)	-20°C to +250°C
Nitrile (NBR)	-30°C to +150°C
Silicone	-50°C to +250°C
EPDM	-40°C to +150°C

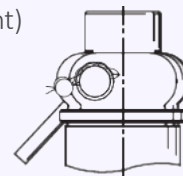
Standard seal materials shown, others are available.

Easing Gear / Lifting Gear / Top Fitting Options

- Sealed Cap (gas tight cap)



- Sealed lever (gas tight)



Technical information by bore size

Bore size	10mm (94610)			15mm (94615)
	Inlet Size	DN15 (1/2")	DN20 (3/4")	DN25 (1")
Outlet Size	DN25 (1")			DN40 (1 1/2")
Flow Area	78.5mm ²			177mm ²
H - Height (Sealed Lever version)	200mm			253mm
TÜV alloted outflow coefficient	0.83 (above 3.0 bar)			0.74 (above 3.0 bar)
Weight (approximate) Kg	3.0			5.3
Set Pressure range - PED (CE) bar	0.3 to 28.0			0.3 to 28.0
Relieving pressure/fully open pressure	Set pressure +10% (0.1 bar below 1.0 bar)			
Reseating pressure	Set pressure -10% (0.3 bar below 3.0 bar)			

- TÜV alloted outflow coefficients for pressures above 3.0 bar, for lower pressures please see the flow rate tables or contact Seetru.
- Maximum permissible built up back pressure = 10% of set pressure at or below which flow is not reduced.
- Stable operation on flows down to 50% of valve rated capacity.
- Leak tightness at 90% set pressure to API 527 and in accordance with EN ISO 4126-1.

Standard INLET Connection Types

- DIN EN1092 Flange PN16, PN25 or PN40
- ASME Flange CL150, CL300 or CL600

Standard OUTLET Connection Types

- DIN EN1092 Flange PN16, PN25 or PN40
- ASME Flange CL150 or CL300

Valve Selection Guide

Valve type	Select Bore	Inlet Size	Inlet Flange Type	Outlet Flange Type	Easing Gear	O'ring material (for cap)
946	Select bore size from above table	Select inlet size from above table	Select Inlet Flange type	Select Outlet Flange type	Select easing gear/top fitting	See table

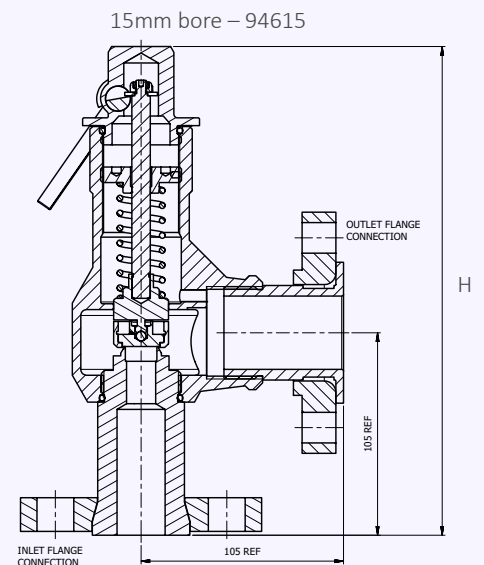
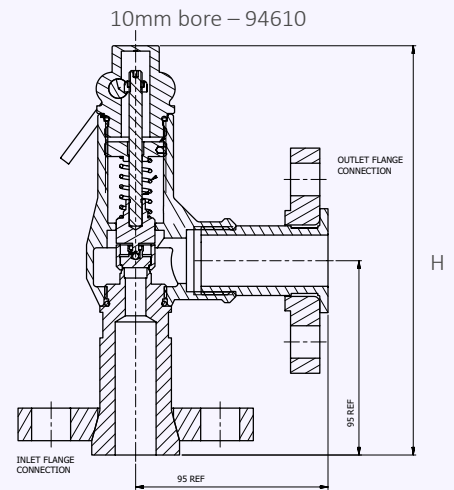
EAC marking available upon request

***Please send your selected details to Seetru and we can provide the full ordering code, price and lead-time.**

Example of Valve Selection Process

Example Selection	946	10	DN20	DIN EN1092 Flange PN16	DIN EN1092 Flange PN16	Sealed Lever	Viton	10.5 bar	16.2 bar
	Valve Type	Bore = 10mm	Inlet Size	Inlet Flange Type	Outlet Flange Type	Top Fitting	O'ring	Set Pressure	Set Pressure

Valve Drawing



Capacity Table - In accordance with TÜV, AIR at 0°C and 1013mbar. Normal m³/hour Type 946: Flow rates at 10% above the set pressure



Set Pressure		Bore Size (D0)			
		10mm	15mm		
bar	psi	Nm ³ /Hour	Nm ³ /Hour		
0.3	4.35	39	76		
0.5	7.25	56	104		
1	14.5	84	155		
2	29	135	270		
3	43.5	191	384		
4	58	240	482		
5	72.5	289	580		
6	87.00	338	678		
7	101.5	386	776		
8	116	425	874		
9	130.5	484	972		
10	145	533	1070		
15	217.5	777	1560		
20	290	1021	2049		
25	362.5	1266	2539		
28	406	1412	2833		

For any intermediate pressures/flows please contact Seetru

Capacity Table - In accordance with TÜV, STEAM. Kg/hour Type 946: Flow rates at 10% above the set pressure



Set Pressure		Bore Size (D0)			
		10mm	15mm		
bar	psi	Kg/hour of Steam	Kg/hour of Steam		
0.3	4.35	32.5	63.3		
0.5	7.25	44.5	82.5		
1	14.5	66.1	121.7		
2	29	106.2	213.4		
3	43.5	149	299		
4	58	186	373		
5	72.5	222	446		
6	87.00	259	520		
7	101.5	295	592		
8	116	332	666		
9	130.5	368	738		
10	145	405	812		
15	217.5	585	1174		
20	290	765	1535		
25	362.5	947	1900		
28	406	1055	2116		

For any intermediate pressures/flows please contact Seetru

for compressed air or gases

cryogenic & liquefied gas

refrigeration

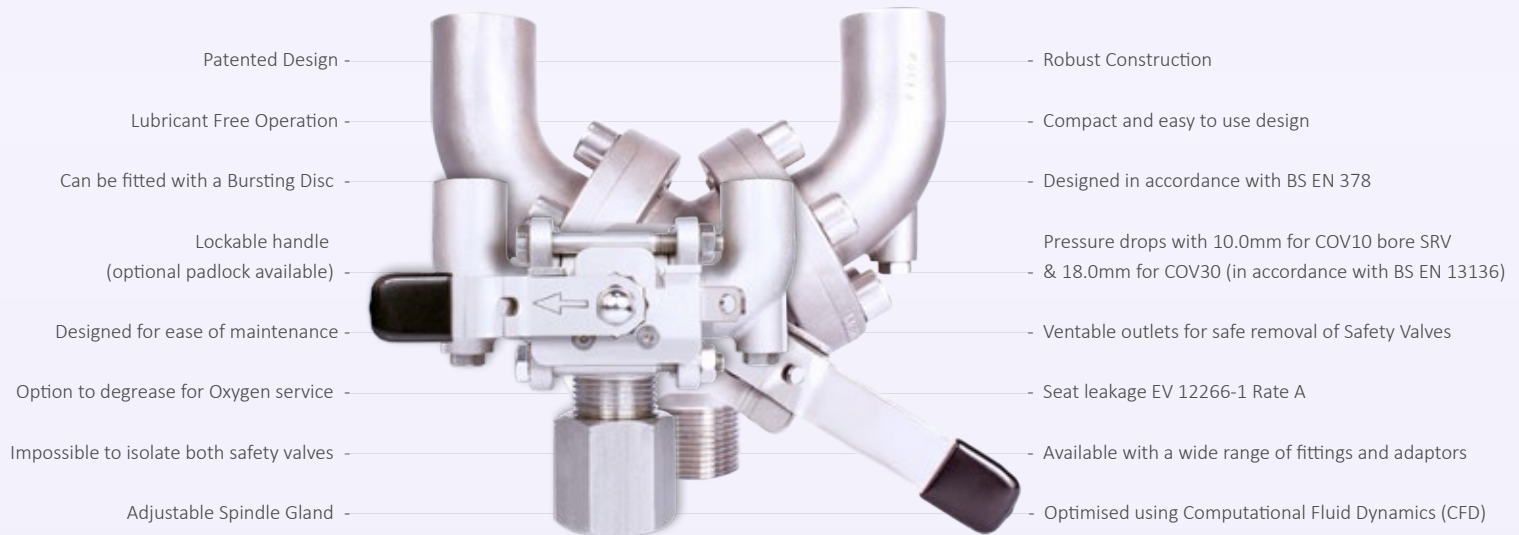
hydrogen

COV10 / COV13 / COV30

Solutions for plant and process efficiency

Change-over valves (sometimes referred to as selector valves or three-way valves) enables the switching of flow from one safety valve to another. Typically used where plant shutdown is impossible or undesirable for process, engineering or commercial reasons. With change-over valves it is possible to switch over between parallel safety valves without interrupting operation, so that maintenance work can be carried out on each safety valve in turn. Seetru change-over valves in combination with our safety valves provide the best solution for plant safety and efficiency. Seetru products are widely recognised for their exceptional quality and reliability.

Features



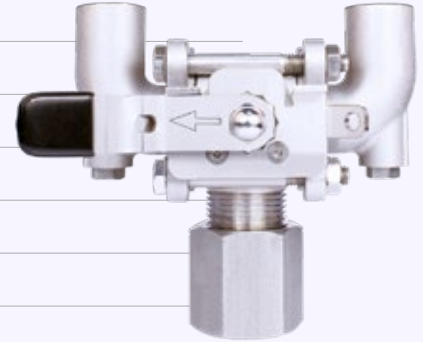
Fluid Mahcanics



The Seetru Change-Over Valves were designed and developed using Computational Fluid Dynamics (CFD) in order to simulate and optimise the flow of the fluids through the valve.

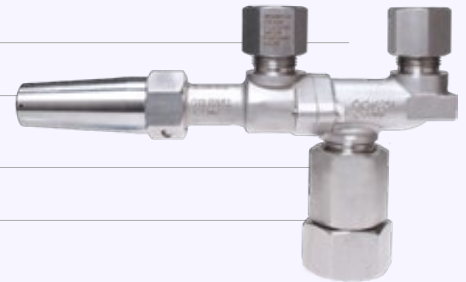
Specifications: COV10

System Connections	½" to 1" BSP, BSPT & NPT
Valve Connection	½" NPT or 3/4" BSP (with or without orientators)
Change-Over Valve Kv	10.0 (Cv= 11.5)
Materials of Construction	Stainless Steel
Seat Materials	25% Carbon filled P.T.F.E.
Temperature Range	-196°C to +200°C
Max Design Pressure	75 bar
Material Certification	BS EN ISO10204 3.1 Pressure Retaining Parts (Optional Extra)
Safety Valve Orifice Size	Up to 10mm (Full Lift Type)
Maximum Safety Valve Set Pressure	75 bar



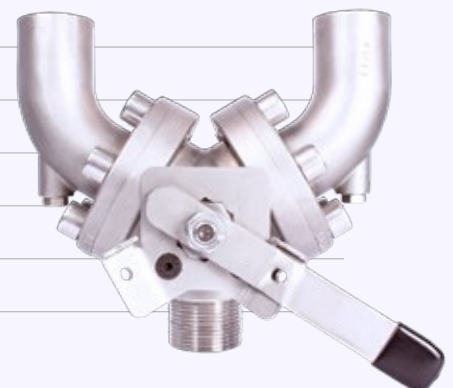
Specifications: COV13

System Connections	Please contact Seetru for information
Valve Connections	Please contact Seetru for information
Materials of Construction	Stainless Steel with Mild Steel or Stainless Steel Internals
Seat Materials	Elastomer P.T.F.E
Maximum Safety valve Set Pressure	65.0 bar
Temperature Range	-30 °C to 200 °C (subject to seal material)



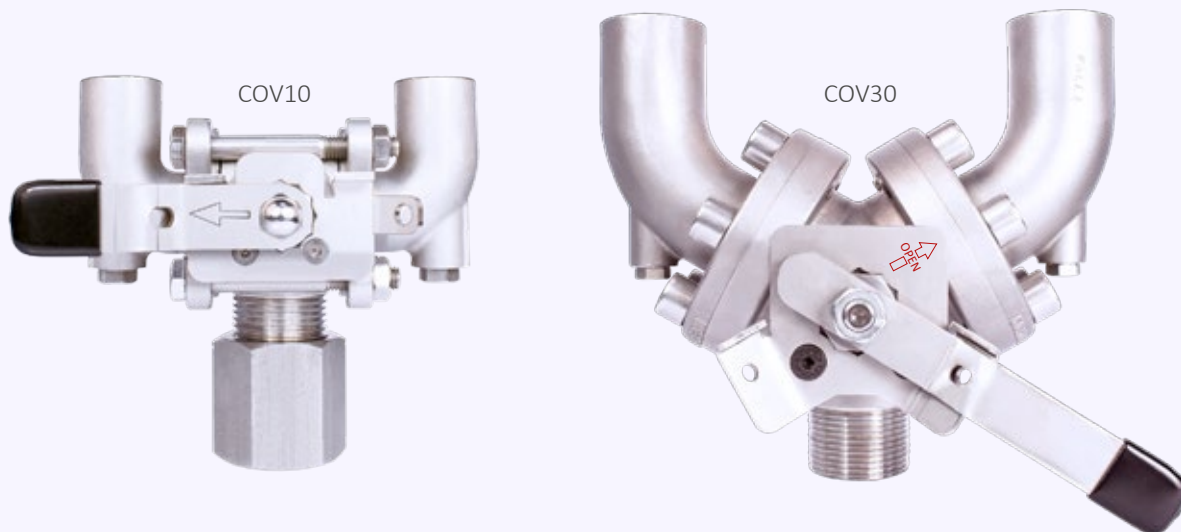
Specifications: COV30

System Connections	1" to 1-1/2" BSP, BSPT, NPT, CL150 to CL600 & PN16 to PN100
Valve Connections	¾" to 1" BSP, BSPT, NPT (with or without orientators), CL150 to CL600 & PN16 to PN100
Change-Over Valve Kv	30
Materials of Construction	CF8M/316/1.4401
Seat Materials	25% Carbon filled P.T.F.E.
Temperature Range	-196°C to +200°C
Max Design Pressure	CL600 or PN100
Material Certification	BS EN ISO10204 3.1 Pressure Retaining Parts (Optional Extra)
Safety Valve Orifice Size	Up to 18mm (Full Lift Type)
Maximum Safety Valve Set Pressure	100 bar

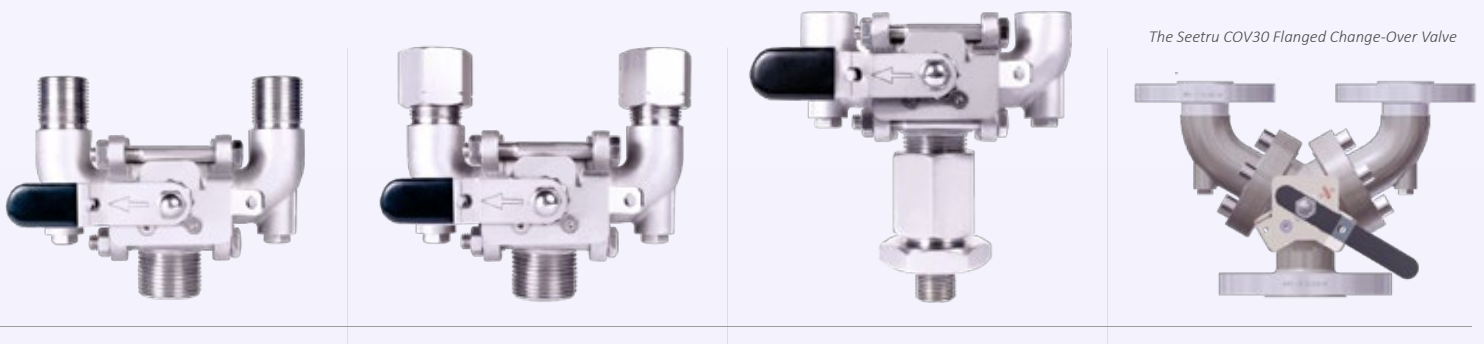


Operation Instructions: COV10 / COV30

1	Unlock handle if locking device fitted (recommended).
2	Starting in a motion away from the duty SRV, rotate handle through 180° (COV10) or 120° (COV30), either clockwise or anticlockwise dependent upon start starting position.
3	Once fully rotated, lock in position if locking device fitted (recommended).
4	If the now standby SRV is to be remove: with caution, un-tighten vent nut of standby Change-over arm by 1 to 2 revolutions to exhaust trapped fluid from change-over arm.
5	Once trapped fluid has de-pressurised, re-tighten vent plug with a tightening torque of 3.0 Nm.
6	Remove the standby SRV.
7	The user may plug the vacant outlet if desired, however sufficient safety procedures (for example Lock out Tag out) must be in place to prevent inadiv inadvertent change over, thus rendering the system un-protected against excessive pressure. If the outlet is plugged, vent arm of pressure, as previously described, prior to removal.



Fittings, Adaptors and Connections



- The Seetru COV10 and COV30 Change-Over Valves can be supplied with a range of fittings and adaptors to provide compatibility with a large variety of systems.
- The COV30 is also available with flanged connections (A or PN).

for refrigeration

The G33 Reflex Gauge

Liquid Level Indicators
Designed for measuring the contents inside a tank

The G33 Reflex gauge is a heavy duty (flat glass) liquid level gauge, suitable for high pressure/temperature combinations. The modular design is made up of compact and robust standard stainless steel precision cast elements.

Refrigerant industry isolating valves are available in a number of flexible configurations offering end mounted, side mounted, rear entry connections, with full centre to centre visibility can be secured with minimum overall length.

G33 Reflex specifications

Connections	BSP & NPT threaded connections
Lengths	Minimum: 216mm Maximum: 3246 mm
Valve types	Refrigeration industry isolation valves
Maximum Temperature	100°C
Maximum Pressure	25 bar

Column arrangements

The Reflex gauge is available with either a straight or staggered column, and a choice of valve positions, to provide uninterrupted centre to centre liquid level indication. With the use of extension pieces most centre to centre distance requirements can be achieved.

Low temperature applications

A polycarbonate frost shield is available which enables the gauge to be used down to -30°C subject to fluid suitability.

Valve options

Sampling valves and drain/vent valves are available upon request.

Graduation

Where a measure of the precise storage volume is required an engraved scale plate can be provided marked with the capacity units.

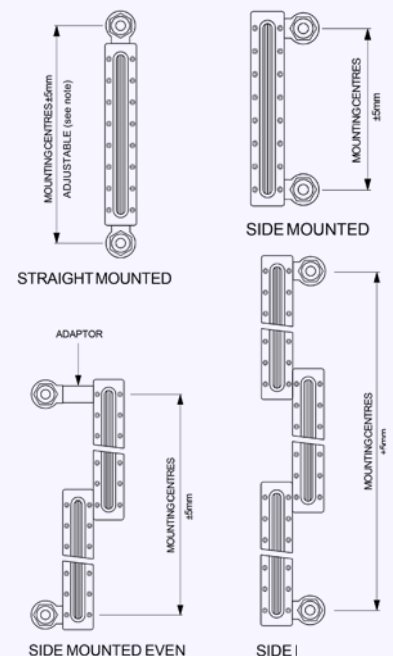
Electronic & digital readout

Remote reading system and/or computer interface options provide a dual system with the advantages of both electronic and sight glass systems. Level alarms can also be implemented.



Materials of construction

Sight Tube	Toughened Borosilicate Reflex Glass
Guard Tube	Stainless steel heavy duty front bezel
Seal	Elastomer
End Unit	Brass or mild steel



for refrigeration

The G35 Seemag Gauge

Liquid Level Indicators
Designed for measuring the contents inside a tank

The Seetru G35 Seemag® tank content indicator or gauge is a high quality yet economical magnetic level indicator. Its unique design offers considerable advantages over conventional magnetic gauges including accurate step-less reading with all round visibility and the option of high/low level alarms with remote digital reading.

G35 Seemag® specifications

Connections	Threaded connections, flanged connections or stub pipe for welding
Lengths	Minimum: 500mm Maximum: 5000mm
Valve types	Valveless (¼ Turn ball isolation valves available)
Densities	0.6 to 2.0 SG.
Maximum Pressure	180°C
Maximum Pressure	22 bar

Magnetic bypass design

The gauge utilises a marker strip on a movable carriage fitted on the outside of a stainless steel tube, which by way of magnets moves up and down in unison with a float inside the tube. The marker strip is adjustable to suit the specific gravity of the liquid to be measured.

Ease of installation and maintenance

The Seemag liquid level gauge can be provided with a variety of end fittings to customer requirement. These include stub pipe for welding, ball valves, and flanges. The gauge is fitted with blanking plugs at the top and bottom of the gauge column. These can be easily removed to allow cleaning of the gauge column.

Tank calibration

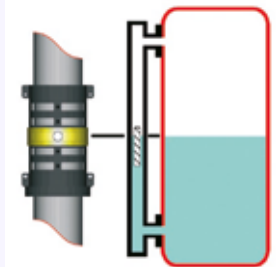
A scale plate graduated in mm is incorporated into the Perspex front cover of the Seemag gauge. Other scale plates can be supplied graduated to customer requirement.

Alarms and electronic/digital outputs

Options available include electronic high and low level alarm sensors, continuous electronic read out signals and displays as well as a digital data feed for direct computer interfaces and digital control systems.

Heating system for high viscosity liquids

The Seemag gauge is available with an electrical, thermal oil and steam heating system. This heats the tube to allow the measurement of high viscosity fluids, such as heavy fuel oils on ships.



Materials of construction

Sight Tube	Toughened Borosilicate Reflex Glass
Guard Tube	Polycarbonate
Seal	PTFE
End Unit	Stainless Steel

